The College Board Review

PROGRAM AND DATES REVISED

Simpler Program, Additional Series Approved For 1949-50

The ninety-ninth regular meeting of the College Entrance Examination Board voted important changes in the Board's services for the 1949–50 testing year.

The one hundred seventy representatives of colleges and schools throughout the nation who gathered at New York's Hotel Biltmore on April 6 decided:

1. To simplify the program of tests.
2. To add a fifth testing date in December and to revise three of the four previously announced dates.

The new alignment of tests will consist of a single morning program, the present Program 1, and a single afternoon program, the present Program 4. Programs 2 and 3 will be eliminated.

Two one-hour achievement tests—one in intermediate and one in advanced mathematics—will be added to the options in the afternoon program. Candidates will still be permitted to take no more than three of the afternoon tests.

Studies at five leading engineering schools made way for the elimination of Programs 2

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Conference, History Planned For Board's Fiftieth Year

A Conference on Admission to American Colleges, to be held in New York in connection with the Board's October 1950 meeting, is expected to be the culminating event in the projected celebration of the College Board's fiftieth year. Tentative plans for the Conference and for a history of the Board's first fifty years were presented to the Board at its spring meeting by Claude M. Fuess, Chairman of the Fiftieth Anniversary Committee.

THE COLLEGE BOARD REVIEW

News and Research of the
College Entrance Examination Board

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Director . . . . . Frank H. Bowles

Secretary . . . . . William C. Fels

Board's College Membership Passes Hundred Mark

With the election at the April meeting of ten colleges and three secondary school associations to membership in the College Entrance Examination Board, the Board now numbers one hundred and four colleges and universities and seventeen secondary school associations. Institutions of higher education are entitled to one voting and one non-voting representative. Associations may designate from one to five representatives depending on the size and nature of the organization.

The newly elected colleges are:

College of New Rochelle
College of Notre Dame of Maryland
The Cooper Union
Drew University
Dunbarton College of Holy Cross
Emmanuel College
Georgian Court College
Marywood College
Saint Mary's College, Notre Dame
Wagner College

New member associations are:

Association of Military Colleges and Schools
Connecticut Association of Secondary School Principals
New Jersey Secondary School Principals' Association

Membership in the Board is open to colleges which are accredited by their regional associations and which make regular use of Board examinations. Associations having purposes in accord with those of the Board are also entitled to apply for membership.

Counseling Aids Available From Secretary Of Board

Materials of use to principals, headmasters, counselors, and guidance officers may be obtained by writing to the Secretary, College Entrance Examination Board, 425 West 117 Street, New York 27, New York.

Terms of Admission to the Member Colleges, Handbook 1949. One free copy has been distributed to each college and school using the Board's examinations. Additional copies, $1.50.

Bulletin of Information. Dates of examinations, registration and fees, descriptions of tests, sample questions. Free.

Annual Report 1948. Description of Board activities, statistical data, lists of members, representatives, examiners, and readers. One free copy will be sent to each college and school using the Board's examinations. Additional copies, $.50. (Not yet available. Publication date, September 1.)

College Board Review. News and Research of the College Entrance Examination Board. Published four times during the academic year. Free.

Hard-covered, looseleaf binders for the *Review* stamped in gold leaf are available at cost, $2.00.

College Choice Statements. A compilation of statements describing the part that college preference plays in the admissions practices of the member colleges. Free.

June 15 Agreement. Contains the text of the uniform acceptance date agreement and a list of the participating colleges. Free.

Monthly Estimate of the Admissions Situation in the Member Colleges (March 31, 1949). Freshman applications received and registrations expected. Free.

Program and Dates—*(Continued)*

and 3. It was found that the score of the mathematical section of the Scholastic Aptitude Test (Program 1) when combined with the score of a one-hour mathematical achievement test proved at least as good a predictor of success in college mathematics as the Intermediate and Comprehensive Mathematics Tests now found in Programs 2 and 3. [A statement concerning the mathematics tests appears on page 92.]

CHANGES IN TESTING DATES

Four changes were made in the previously announced testing dates: January 14, April 15, June 3, and August 23, all in 1950.

1. A new December 10, 1949, series was approved to accommodate colleges admitting freshmen in February.
2. The April 15, 1950, series was advanced to March 11, 1950, for one year only. The April date, later than in any previous year, had been chosen reluctantly because of the late Easter and Passover, and school vacations. It then appeared that it would be impossible to report scores to colleges in time for them to notify applicants of admission or rejection before the students left high school. The March 11 date was selected as the last Saturday which will permit timely reporting and avoid vacations.
3. The June 3, 1950, series was advanced to May 20, 1950, to avoid conflict with graduations.
4. The August 23, 1950, series was advanced to August 9, 1950, early enough to be useful for late applicants for September admission.

The January 14, 1950, series stands as announced, as do the remaining dates in the current testing year, June 4, 1949, and August 24, 1949.

Dates, Tests, Fees: 1949-50

The current programs of tests will be offered as announced on June 4, 1949 and August 24, 1949. The revised programs listed below will be offered for the first time on December 10, 1949.

EXAMINATION DATES

December 10, 1949
January 14, 1950
March 11, 1950
May 20, 1950
August 9, 1950

EXAMINATION PROGRAMS

Morning Program

Scholastic Aptitude Test
(Verbal Section)
(Mathematical Section)

Afternoon Program

Achievement Tests
(a maximum of three afternoon tests)

English Composition	Biology
Social Studies	Chemistry
French Reading	Physics
German Reading	Intermediate Mathematics
Greek Reading (March only)	Advanced Mathematics
Italian Reading (March only)	Spatial Relations (an aptitude test)
Latin Reading	
Spanish Reading	

EXAMINATION FEES

Morning Program and Afternoon Program	$12.00
Morning Program only	6.00
Afternoon Program only	8.00

Chief Mathematics Examiner Explains Changes In Tests

Professor John R. Kline, Colonel Thomas A. Scott Professor of Mathematics at the University of Pennsylvania and Chairman of the Board's Committee of Examiners in Mathematics, has prepared this statement explaining changes in the mathematics tests voted at the Board's April meeting.

The College Board has unanimously approved a recommendation of the Committee on Examinations which involves a very important change in the program of examinations for mathematics.

In the group of examinations offered during the morning under the system now in force, Program 2 contains an achievement examination of one and one-half hours in Intermediate Mathematics while Program 3 contains a two-hour achievement examination in Comprehensive Mathematics; Program 1 and the remainder of Programs 2 and 3 are devoted to aptitude tests.

APTITUDE TESTS IN MORNING

In accordance with the plan which becomes effective December 1949, the entire morning session will be devoted to the Scholastic Aptitude Test, verbal and mathematical sections. The division of time between the two sections, verbal and mathematical, of the Scholastic Aptitude Test will be approximately in the ratio of three to two. The achievement tests in mathematics will become a part of the afternoon program, for in addition to the achievement tests now offered in the afternoon there will be a one-hour test in Intermediate Mathematics and a one-hour test in Advanced Mathematics. Thus in all cases it will be possible for the candidate to present two scores which are indicative of his mathematical power—one, the mathematical aptitude score, and the second, an achievement score.

Before this change was recommended, a very careful study was conducted at five of our leading engineering schools to ascertain whether a two-hour comprehensive mathematics achievement test or the information given by the results obtained from a mathematical achievement test of one hour combined with the mathematical aptitude score had greater predictive value. The study indicated that the difference between the predictive values of these two alternatives was slight, but in every case the information received from one hour of achievement and one hour of mathematical aptitude correlated higher with actual performance in college.

NEW PROGRAM SIMPLER

The new program of the Board will offer a greatly simplified program of real advantage to the schools as well as to the colleges.

1. Under the new system, candidates who are applying to a number of different institutions will find it simpler to adjust their battery of examinations to the varying entrance requirements.
2. Under the present Programs 2 and 3 persons who are taking mathematics in their senior year are frequently required to take an achievement test in the morning and three achievement tests in the afternoon. The new system avoids this; no candidate will find it possible to take more than three achievement tests. (Under the old system it is reported that some candidates did not take mathematics in the senior year in order to avoid the necessity of taking four achievement tests and thus finding it impossible to drop their

weakest senior subject from the list of tests offered.)

3. Guidance officers in the secondary schools will find the new plan much easier to explain to candidates; it will also be simpler to administer and score.

The Intermediate Examination will cover the material contained in a year and one-half of algebra and one year of plane geometry. The Advanced Examination will cover trigonometry, algebra, and solid geometry. The algebra will include exponents, logarithms, progressions, binomial theorems, inequalities, and complex numbers. The solid geometry questions will be confined mainly to the relation of lines and planes in space, the computations of volumes and areas. It should be emphasized that schools have absolute freedom to arrange the senior year courses in advanced mathematics in the manner which they feel will best prepare the student for subsequent work in college.

The Board assures the schools that there will be sufficient questions on all topics so that the mathematical achievement of each candidate will be fully tested even though the preparations have been varied. The tests will place candidates in their proper order among the total list of candidates who are applying for college entrance. Great emphasis should be placed upon the fact that in no case should thoroughness of preparation on any group of topics be sacrificed in order to achieve a superficial acquaintance with a wider range of material.

Thirty-eight Colleges Use Uniform Acceptance Date

Newcomb College of Tulane University and Russell Sage College have joined the thirty-six colleges now participating in the "June 15" agreement. The subscribers to the agreement, originally entered into in 1948 by Brown, Columbia, Cornell, Dartmouth, Harvard, Pennsylvania, Princeton, and Yale, have bound themselves not to require any candidate admitted as a freshman to give notice before June 15 of his decision to attend a subscribing institution or accept financial aid from it. Whenever a student can reach a decision before June 15, he is at liberty to notify the institution.

Previous subscribers to the agreement are listed in the *College Board Review* for March 1949. A complete list may be obtained from the Secretary of the Board upon request.

Board To Develop, Administer Fourteenth Grade Tests

In a series of eight resolutions passed at its April meeting, the Board moved to develop and administer a program of college entrance examinations at the fourteenth grade level in addition to the tests it now administers at the twelfth grade level.

Demand for fourteenth grade tests has resulted from the rapid increase in the number of non-terminal junior college students applying for admission to the third-year classes of Board member colleges. Admissions officers have felt the need for suitable measures of the aptitude and achievement of these applicants, comparable to the measures they now apply to secondary school seniors.

BOARD EXPLORES PROBLEM

The Board began its exploration of this field last October at the request of a member college. In February, representatives of the Board, senior colleges, junior colleges, educational associations, the Educational Testing Service, and the U. S. Office of Education met at the University of Michigan to deter-

mine what purposes such examinations might serve and what lines their development should follow.

The representatives outlined three major areas in which a nationally standardized program of aptitude and achievement examinations at the fourteenth grade level would serve existing needs:

1. It would form one element in predicting success in the last two years of senior college work. Hence it would be useful:
   a. to senior colleges in the admission of transfer applicants, whether from other senior colleges or from junior colleges.
   b. to senior colleges in the promotion and guidance of their own sophomores.
   c. to junior colleges in advising their students regarding further educational plans.
2. It would serve as a broad measure of a student's achievement during his first two years of college work, and would thus be useful for placement:
   a. in senior college courses.
   b. in professional school programs.
   c. in programs of further training such as are now offered by many business and industrial organizations.
   d. in adult education courses of various kinds.
3. It would serve as a broad measure of achievement for the person who has enjoyed a minimum of formal education. Hence it would be useful:
   a. as a college equivalent examination.
   b. as a test of fitness for advanced formal study.
   c. in counseling and guidance by social agencies.

The recommendations of the Michigan group have been embodied in the resolutions passed by the Board at its spring meeting:

1. That the College Entrance Examination Board undertake the development of a fourteenth grade examination program.
2. That the fourteenth grade tests be devised in such a way that they do not influence the pattern and content of college courses or that they hold such influence to the irreducible minimum.
3. That, if it is possible to devise satisfactory tests, the College Entrance Examination Board offer one series of fourteenth grade tests in the spring of 1950.
4. That, under the direction of the Board, the examinations be developed by the Educational Testing Service, making such use as possible of existing materials.
5. That the tests be under the supervision of appropriate committees of examiners.
6. That the American Council on Education be invited to join in the sponsorship of the tests.
7. That the Chairman appoint a committee which will be responsible for carrying out resolutions (1) through (6) above.

The eighth resolution empowered the Director to expend the necessary funds for the development and administration of the examinations.

The American Council on Education has agreed to join in the sponsorship of the tests. A committee is now being appointed jointly by the Chairman of the College Board and the President of the Council in accordance with resolution No. 7.

EVOLUTION OF MATH TESTS

Eleanor J. Riegel

The author is a member of the Mathematics Section of the Test Construction Department of the Educational Testing Service.

From their beginning the College Board examinations in mathematics have undergone a series of changes which reflect both a progressive trend in testing techniques and adaptations to the needs and policies of the colleges using the entrance examinations.

In the early period of CEEB test history, the examinations in mathematics were achievement tests consisting solely of formal problems in various subject-matter fields. At one time, tests in nineteen different fields of secondary school mathematics were administered annually. This number was gradually reduced until in 1941 these restricted examinations were all discontinued.

APTITUDE TEST INTRODUCED

In 1926, in response to a need for a test of general mental ability to supplement its array of achievement tests, the CEEB introduced the Scholastic Aptitude Test (SAT). The term "scholastic aptitude" was chosen by the Board to distinguish this general test of mental ability from a test of training in school subjects. The first SAT contained several tests of verbal ability and two mathematics subtests: arithmetical problems and number series completions. It was not until 1930, however, that a separate mathematics section, consisting mainly of formal manipulative problems in algebra and plane geometry, was added to the SAT, and separate verbal and mathematical scores were reported.

Because of the effect of specific preparation and tutelage on candidates' scores on achievement tests in mathematics, it became necessary to develop a less stereotyped series, and in 1933 a special commission was appointed to recommend modifications in the existing programs. In 1936, as a result of the committee's suggestions, the Mathematics Attainment Test (MAT) was offered for the first time. This program tested mathematics at three levels of preparation, with Alpha, Beta, and Gamma levels covering two, three, and four years of study in mathematics. The commission believed that a general test in mathematics, such as the MAT, would be more effective for the purposes of the Board than a series of tests in separate subject-matter fields. The committee saw in the MAT possibilities for measuring not only essential techniques and a knowledge of mathematical facts but also basic principles and methods of approach in mathematics. The introduction of a general examination was calculated to give teachers more freedom in choosing curricula and teaching methods. At the same time, however, the content of the examinations was defined in a general way in order to prevent any confusion on the part of teachers.

Simultaneously with the introduction of the MAT, the mathematics section of the SAT was discontinued in the belief that its function and its content were duplicated by the Alpha level of the MAT. However, some educators and boards of admission of liberal arts colleges felt that the MAT program did not meet their particular needs. This led in 1938 to the reinstatement of the mathematics section in the SAT.

COMPREHENSIVE MATHEMATICS TEST

A further revision in the mathematics program came in 1943 with the dropping of the Alpha and Beta levels of the MAT and the replacement of the Gamma level by the Comprehensive Mathematics Test (CMT). The CMT, which covered broadly the four years of secondary school mathematics, was considered particularly appropriate for students who planned to major in some field of science or to enter engineering schools and who therefore would be required to present four years of study in mathematics for entrance.

The mathematics section of the SAT, meanwhile, was more and more emphasizing applied reasoning problems and putting less and less stress upon formal manipulative problems in algebra and plane geometry, since for most students the latter type constituted a test of achievement rather than of aptitude. But schoolmen saw certain limitations with only two mathematics programs, the revised SAT and the CMT: students who had studied three years of mathematics had no opportunity to show the level of their achievement. In order to rectify this situation, the Intermediate Mathematics Test (IMT) was instituted in December 1947. Since then three mathematics programs have been administered simultaneously at the morning session, each accompanied by a test of verbal ability varying in length according to the program.

DEVELOPMENT OF TYPES OF PROBLEMS

The development of types of problems is an important phase of the history of Board examinations in mathematics. The two types used most frequently until the past few years are described by their answer forms—"demonstrative" and "answer-only."

The first term, "demonstrative," designates any problem for which the candidate must show all his work of solution as well as his answer. The scoring of this problem type entailed considerable difficulty because it was necessary not only to check the answer but to evaluate the entire solution. This process was time-consuming, required scorers who had a background in college mathematics, and yielded results which on occasion varied considerably from one scorer to another.

The second term, "answer-only," applies to any problem to which the candidate records only his answer, having worked out his solution on scratch paper. The scoring of this problem type was obviously less cumbersome and less variable because credit was given only if the correct answer had been recorded in the test booklet. However, the correct answer might appear as any one of several mathematical expressions and therefore a certain amount of subjectivity still entered into the scoring process.

A third problem type, multiple-choice, has been used exclusively in all of the Board mathematics examinations since December 1946. This type is exactly like the answer-only form except that the candidate must choose the one correct answer from five or eight options rather than give a free response. This form lends itself to quick hand- and machine-scoring, is completely objective, and has been shown to be as valid as the demonstrative and answer-only types.

The following examples show how one basic problem would appear in the three answer forms:

1. Demonstrative type:
   The perimeter of a certain square is equal to the circumference of a circle of radius r. Which figure has the greater area? Show why.
2. Answer-only type:
   The perimeter of a certain square is equal to the circumference of a circle of radius r. What is the ratio of the area of the square to the area of the circle? .....
3. Multiple-choice type:
   The perimeter of square PQRT is equal to the circumference of circle O of radius r.

   $$\frac{\text{area PQRT}}{\text{area circle O}} = (?)$$

   $$(A)\frac{1}{2r} \quad (B)\frac{1}{4} \quad (C)\frac{\pi}{4} \quad (D)\frac{r}{8} \quad (E)\frac{\pi r}{16}$$

   The correct answer to the multiple-choice problem is (C).

The mathematics section of the SAT is at present a test consisting primarily of reasoning problems, many of which are of an applied nature. These problems involve simple arithmetic, simple algebraic techniques and principles, and certain fundamental concepts in plane geometry. To the extent that the test measures a candidate's ability to apply these simple basic concepts to new situations, to that extent it indicates his general mathematical ability, that

is, his ability to learn in any subsequent, more advanced mathematics course.

The IMT and the CMT are considered tests of achievement because their chief function is to indicate the extent of a candidate's preparation in mathematics. Colleges are able to use the scores from these tests both in selecting and in placing candidates. In a sense, these achievement tests are aptitude tests. Of course, unlike the SAT, the IMT and the CMT give evidence of a candidate's general ability in mathematics on the basis of his performance following specific training. These tests, however, have a fundamental element in common with the SAT. While they test more advanced principles, techniques, and procedures than the SAT, they force the candidate to apply these principles, techniques, and procedures to new situations. Every effort is made to avoid testing mere memorization of facts, formulae, or theorems; instead, the student is compelled to reason and to select from his background and knowledge the fact or technique which pertains to the new problem.

The following examples may serve to show the differences between aptitude and achievement problem types in mathematics. Example 1 is classified as an aptitude problem because its solution requires a definite reasoning process but only a fundamental arithmetic operation. Example 2, on the other hand, is classified as an achievement problem because it involves the formal technique of factoring and presumes a knowledge of second-degree equations with possible double roots. This problem tests aptitude also in that it requires the examinee to see relationships and to recognize the possibilities for applying certain formal skills in a new way.

1. If 1 pound of oranges is equivalent to 2 to 4 oranges, what is the least possible weight, in pounds, of 3 dozen oranges?

   (A) 6 (B) 9 (C) 12 (D) 16 (E) 18

2. If $x^2 + y^2 = 12$ and $xy = 2$, then $x + y = (?)$

   (A) $\pm\sqrt{10}$ (B) $\pm 2\sqrt{3}$
   (C) $\pm\sqrt{14}$ (D) ± 4 (E) 6

The correct answers are:

1. (B)
2. (D)

There can never be a sharp dividing line between an aptitude and an achievement test. No test can measure general ability irrespective of training. Conversely, no measure of performance after training can be considered apart from its value as an indicator of aptitude. The Board, in general, makes a distinction between aptitude and achievement in mathematics on the basis of training involved. Tests constructed primarily to measure ability uninfluenced by specific training are called aptitude tests; those designed to measure the results of training are called achievement tests.

NEW MATHEMATICS PROBLEMS

During the past year several problems involving the mathematics programs have been brought to the attention of the Board. It has been reported that the present arrangement of achievement testing has affected enrollment in senior-year subjects. Many colleges require applicants to take a mathematics achievement test which is offered at the Board's morning session and three other achievement tests which are offered at the Board's afternoon session, but since most students study only four subjects during a semester, the candidate who is enrolled in a fourth-year mathematics course has no choice in his selection of the three achievement tests. Therefore, students are reportedly avoiding fourth-year mathematics in order to be in a position to eliminate the weakest of their four senior-year subjects when choosing the three tests they will take in the afternoon.

Another serious problem results from differences among colleges in their entrance requirements. Boards of admission vary in their ideas about the relative merit and usefulness of an achievement test as against an aptitude test. Consequently, some colleges advise applicants to take the SAT; others recommend the IMT or the CMT. The student who applies to more than one college may be confronted with two conflicting requirements and may be forced to choose

between colleges on the basis of the mathematics examination he chooses.

Several practicable plans for revision of the mathematics programs evolved from a consideration of these problems. The best of these seemed to be the proposal that the morning program be devoted entirely to aptitude testing and that both a verbal and a mathematical aptitude score be reported for every candidate. Under this plan the IMT and the CMT would each be reduced to one hour and transferred to the afternoon program on an equal footing with the other achievement tests. All colleges which require evidence of the level of achievement in mathematics would advise candidates to take one of these mathematics achievement tests.

VALIDITY STUDY CONDUCTED

This proposed plan, however, gave rise to the question as to whether or not the score on the mathematics section of the SAT and the score on a one-hour mathematics achievement test would be adequate; it was possible that one hour each of aptitude and achievement testing would be too limited to serve the needs of engineering schools. In an effort to answer this question, a validity study was conducted by W. B. Schrader and Norman Frederiksen of the Research Department of Educational Testing Service. The validity of any test is the correlation between that test and some accepted measure of the abilities which the test is designed to evaluate. The purpose of the study was to determine the correlations of various combinations of mathematical aptitude and mathematical achievement material with grades in first-semester courses in engineering schools. The study was arranged for the fall of 1948 in cooperation with five large engineering schools: Carnegie Institute of Technology, Cornell University, Lehigh University, Rutgers University, and the University of Pennsylvania. Three hours of mathematics tests were specially administered to the majority of freshman engineering students entering these five colleges in the fall of 1948. Each student was given the one-hour mathematical section of the SAT used in the January 1948 series and the two-hour CMT used in the June 1948 series. It was possible to break down Program 3 (CMT) into its component parts, two half-hour subtests composed of short items (each problem requiring about one minute for solution) and two of long items (each problem requiring over one minute for solution). These four half-hour subtests were studied in various combinations and in conjunction with Program 1 (SAT). Validity coefficients were determined for these combinations on the basis of first-term mathematics grades and first-term average grades. The following results are quoted directly from the report of the study by Schrader and Frederiksen:

"Correlations of each of four mathematical tests with first-term average grades and with first-term mathematics grades are given in the table below. In the first row are shown the validities of a combination in which one hour of Program 3 'short items' and one hour of Program 1 items are given equal weight; the

(Continued on page 102)

Validity Coefficients of Four Mathematical Tests
With First-Term Mathematics Grades and First-Term Average Grades

TEST	Composition of Test		Correlation of Test with Math Grades					Correlation of Test with Average Grades				
			COLLEGE					COLLEGE				
	Achievement (Program 3)	Aptitude (Program 1)	A	B	C	D	E	A	B	C	D	E
Equally Weighted Composite	1 Hour (short items)	1 Hour	.60	.51	.52	.59	.65	.55	.52	.37	.64	.68
Average of Six Composites	1 Hour	1 Hour	.60	.50	.50	.56	.65	.56	.50	.35	.62	.67
Program 3	2 Hours	——	.59	.50	.50	.56	.62	.55	.47	.32	.60	.66
Program 1	——	1 Hour	.56	.46	.46	.53	.64	.52	.50	.35	.59	.64

TESTS OF THE COLLEGE BOARD

William W. Turnbull

This is the first of a series of articles that will survey the Board's testing and research programs. Dr. Turnbull is a Vice-President of the Educational Testing Service.

Why does the College Board give examinations? As is always true for "why" questions, the answer is complex. But the primary over-all purpose of giving CEEB tests is to help in the process of getting the right people into the right colleges. To do this job the tests must be useful aids in identifying talent and they must afford a reasonably good prediction of college success.

Success in what college? As Hamlet put it, "Ay, there's the rub." The Board numbers among its members over one hundred colleges and universities, and many more make use of its services. They include institutions in every part of the country, specializing in nearly every kind of curriculum. The Board's tests must forecast success in all of these institutions. And to do so, they must be designed to fit thousands of students as dissimilar as the infinite variety of home and school backgrounds from which these students hail.

Prediction is not the only aim, however, even though it is the primary one. Colleges look to the tests for certification of achievement. The scores serve both as a common denominator in trying to interpret the diversely stated high school records of the candidates and as a basis for sectioning admitted students into appropriate classes. And schools, for their part, use the results in diagnosing the strengths and weaknesses of their students and in counseling them about their educational futures.

The observer whose interest is more than casual may ask about two other purposes which are often alleged. The first might be phrased this way: Is it not true that many an admissions officer uses the scores as a drunk uses a lamppost—for support rather than for illumination? Sometimes, undoubtedly. Few admissions officers would deny that it is reassuring on occasion to have test scores confirm a hunch about a candidate, but there are, of course, the frequent occasions when the scores cast doubt where none had been before. The action then taken depends, or should depend, on the degree of success the college has had in the past in using the scores and in recognizing the exceptional cases.

The second purpose often stated by those who know the Board's history is that the tests act as guide-posts or motivating agents for teachers and pupils alike. To quote again from Shakespeare, "It is the star to every wand'ring bark, whose worth's unknown, although his height be taken." This fact cannot be denied; but what is not always realized is that the exercise of that influence is not a primary purpose of the Board's examinations. In fact, in recent years the Board has done all in its power to minimize the impact of its practices on secondary education.

CHANGE IN POINT OF VIEW

The change in point of view has been revolutionary, in a quiet way of course—so quiet that it has gone unnoticed by a sizable proportion of the educational community. Since 1900 the Board had stood for a system designed to uphold standards in those schools which prepared their students for the core of colleges that constituted the Board itself. Then, over the past ten or fifteen years, the shift began and gained momentum. The core of colleges looked increasingly to new sources for their students; more colleges, in new areas, made use of the tests; the number of students doubled and quadrupled. No longer was it realistic for the CEEB to prescribe for teachers preparing their students for Board tests; instead, the Board had to adjust itself to a situation in which a greater and greater number of candidates and their teachers, scattered widely throughout the country, were totally unfamiliar with the CEEB sys-

tem, sometimes almost unaware of its existence. The Board stopped publishing syllabi or old examinations which served as syllabi and deliberately withdrew from the field of curricular design. At the same time it began to give increased attention to the problem of finding out what was being taught in the schools at large and how examinations might be devised to measure fairly the achievement of students whose work had been within the most usual boundaries but not necessarily in line with previous CEEB recommendations. Along with the new philosophy, and implementing it, came the "new type" or objective examinations with their great numbers of questions, providing course coverage broad enough to encompass widely differing syllabi.

How did the schools and colleges look upon the new state of affairs? For the most part, those that saw its coming applauded it. Many schools recognized that the change provided a genuine opportunity to bring into their courses the variety and individuality they had previously been unwilling to risk for fear of jeopardizing their students' chances of success on "the Boards." Others regretted the passing of the day when the Board stood as the bulwark of the best in secondary education. Still others mourned the loss of guides for the instruction of young minds in the fine art of making high Board scores. But perhaps the majority is only now beginning to realize fully that the Board has deliberately abandoned its role as arbiter of what should be taught, in favor of a new and more difficult role as impartial assessor of abilities and broad accomplishment, regardless of the means of their development.

It is not easy, of course, to assess abilities and achievement separately; elsewhere in this issue attention is given to their interdependence. However, the Scholastic Aptitude Test has gained a wide following as a useful indicator of two abilities that enter into academic work: verbal and mathematical aptitudes. Tests of these important aspects of mental development are included in the SAT, given in the morning in the Board's test series. In the afternoon the student (if he takes a full day's tests) chooses up to three of the considerable number of one-hour achievement tests offered in the most widely studied of the subjects that are generally accepted for credit by colleges. As can well be imagined, new claimants for inclusion are constantly appearing, and the Board has continuously before it the job of deciding in which subject-matter areas examinations would be most useful. At present the list includes English, Social Studies, Physics, Chemistry, Biology, French, German, Spanish, Latin, and a single aptitude option, Spatial Relations. In addition, tests in Greek and Italian are available at the spring series. Beginning next year, the tests in Intermediate and Advanced Mathematics will move from their present status as morning tests to positions among the afternoon examinations, leaving only aptitude sections for the morning. At the test series which includes Greek and Italian the candidate will then have his choice of three out of fourteen possible afternoon tests.

THE PROBLEM OF DATES

The problem of various examination series (i.e., examining dates) is itself a significant one. In the early days of the Board the tests were given only once a year—in June, when students had completed their year's work. Twelve years ago a special all-objective series of examinations for scholarship purposes was introduced in April, designed to be "taken in stride" rather than specially prepared for. The growth of the April objective examination series, which occupied a single day rather than the full week needed for the June essay examinations, was exceedingly rapid. Within four years more than half of the applicants were taking the earlier tests, and in recent years the number tested in June has been only 15 or 20 per cent of the total group.

As the widespread use of the spring testing date proved that it was filling a definite need, the Board experimented with series at other times of the year: a late summer testing date for "make-up" purposes and a winter series for use by institutions which were admitting students at midyear. The winter date enjoyed immedi-

ate popularity with some colleges—particularly those most interested in aptitude scores—as a testing time for students seeking admission for the following fall. The trend toward earlier testing is very clearly defined, although not universally welcomed, and by recent action of the Board the "April" date will be moved to March 11 next year, for reasons explained elsewhere in this issue. Next year also, the time-honored "June" series will be advanced to May 20.

A question not infrequently asked is, "How can you expect a student to pass an examination taken before he finishes the course?" First of all, there is no such thing as "passing" a Board examination: each college has a different idea of acceptable scores and counts these as only part of the information on which it will base decisions. Secondly, a student's score on a Board test simply ranks him with respect to the other students taking the same test. Since the score merely expresses how far above or below the "average" student a given candidate stands, the time of the examination loses in importance: all students are in the same boat, at any rate, and their scores relative to one another will not suffer because of an early examination date.

On each testing date the examinations are given all over the country, at as many as five hundred centers for the larger series. The rule is that no candidate must travel more than sixty-five miles to be examined; if he would have to do so, a new testing center is established.

For the past year and a half the College Board has not itself administered its examination program, but has entrusted that important function to the newly created Educational Testing Service. The latter organization was formed in January 1948 by a merger of the nonprofit testing enterprises of various agencies working in the educational field, including the Board, the American Council on Education (represented by the Cooperative Test Service and the National Teacher Examinations), and the Carnegie Foundation (which had previously sponsored the Graduate Record Examination and related projects).

Under the new arrangement, the College Board retains the same control it has always had over all phases of its testing program, which is now carried out by ETS. Points of particular interest, in view of the entry of ETS upon the scene, are the way in which the Board tests are prepared and the roles played in their preparation by the Board, the ETS, and teachers.

As in the past, the Board exercises ultimate authority over such questions as the particular subjects in which tests shall be given, the length of the testing sessions and of the individual tests, and other general questions of examination policy. These matters are considered by the Board's Committee on Examinations. In addition, the Board appoints annually a five-member committee to prepare the examinations in each subject—English, Social Studies, etc.

COMPOSITION OF COMMITTEES

The composition of these committees of examiners is, of course, a matter of considerable importance, since the viewpoints of different kinds of secondary and collegiate institutions must be represented. Typically, a Board committee of examiners consists of three college teachers, one public school teacher, and one teacher from an independent school, who are favorably known by their colleagues and whose fields of major interest cover the area of the test as broadly as possible. Diversification with respect to geographical location, composition of student body (men, women, coeducational), and various other factors are all considered.

The manner in which the committees operate in preparing the tests will be considered in detail in subsequent issues of the *Review*. In general, however, the committee members meet in the spring to consider the next year's examinations. They then work closely with test specialists from the Educational Testing Service in developing about twice as many questions as will be needed for the examinations. ETS takes responsibility for giving, to students roughly comparable to those who will eventually be examined, a trial test (or "pretest") and for working out statistical indices of the worth of the individual questions. In order to compose

the final form of the test the committee members meet again with ETS staff members and consider the pretest results in the light of their teaching experience. While ETS cooperates closely at all stages of test preparation, final responsibility for the content of the achievement tests rests—as it should—with the members of the teaching profession who constitute the committee. The preparation of the Scholastic Aptitude Test is undertaken directly by ETS.

BOARD A FORUM

The Board itself constitutes a forum in which problems of educational policy are decided by democratic action. Problem-solving requires facts as well as principles, however, and to get the facts a strong research program is essential. How are scores on the various Board tests in mathematics related to one another? How predictive are they of success in engineering courses? How can scores on foreign language tests be adjusted to take into account variations in years of training? What is the predictive value of the CEEB tests for College X, which is wondering whether or not to begin using them? What testable abilities and skills enter into the writing of English? How satisfactorily can interests, attitudes, and such characteristics as persistence be measured to provide data supplementary to scores on academic factors? Such questions arise constantly as a testing program evolves and grows, and are subject to decision on the basis of data rather than casual opinion. The Board has a strong tradition of grounding its actions on thorough research and accordingly is making the questions enumerated above (and many more) the subjects of experimental study. The Board itself does not maintain a research staff, but appoints a Committee on Research which screens the various proposals for investigations. ETS helps to advise on the feasibility of these research projects and through its Research Department carries out those which give promise of useful results. In systematic investigation of the facts and fallacies upon which the present structure is built rests the greatest hope for progress.

Evolution of Math—*(Continued)*

second row gives the average value obtained when each of six different one-hour units of Program 3 items were combined with Program 1, giving equal weight to aptitude and achievement material. The third and fourth rows show validities of the Program 3 and Program 1 tests, respectively.

"When the results are viewed as a whole, the similarity among the validity coefficients obtained by two hours of testing in any one of the five colleges is striking. The combination of aptitude and achievement items (particularly when 'short-item' achievement materials are used) appears to have a slight advantage over the two-hour achievement test. The difference, however, is too small, taking into account the size of the groups on which the coefficients are based, to warrant the conclusion that the combined test is superior."

Since it appeared from the study that the combination of a one-hour aptitude test and a one-hour achievement test in mathematics would serve at least as well as the present two-hour achievement test, the new system which had been proposed to solve the problems inherent in the present three-program arrangement seemed feasible. Accordingly, a resolution concerning mathematics examinations and based on the results of this study was passed by the Board at its April meeting this year. Effective in December 1949, the SAT only will be offered in the morning. All morning candidates will be required to take this single program, and both verbal and mathematical aptitude scores will be reported. In place of the present IMT and CMT, one-hour achievement tests in intermediate mathematics and advanced mathematics will be included in the afternoon program. Candidates who are required to show proficiency in mathematics beyond the second year may take either or both of these achievement tests. The Board is confident that valid examinations in mathematics will not be sacrificed by this revision; instead, the value to member colleges of all phases of Board testing will, it is hoped, be increased.

President Of Coe College Addresses Board Luncheon

President Byron S. Hollinshead of Coe College, Cedar Rapids, Iowa, addressed the Board's representatives at a luncheon following the Board meeting at the Hotel Biltmore in New York on April 6.

Speaking on "Which of the Independent Colleges Will Survive," President Hollinshead concluded: "Our future position is difficult but possible. The present odds against us on the side of the tax-supported institutions seem insuperable. However, the stronger independent colleges have a chance (especially those in the East) if they have a defined and defensible purpose, if they are working at fund-raising with every resource at their command—through parents, alumni, students, and friends—if they will develop arrangements with business, if they will try to keep their programs to a reasonable scope, and if they are developing sideline services to their communities. Further, the temper of the times seems to favor vast tax expenditures, but the temper may change as more people begin to feel its burden and question its wisdom. In this lies hope."

The full text of Dr. Hollinshead's address may be had from the Secretary of the Board upon request.

Representatives Will Meet In New York On October 26

The one hundredth regular meeting of the College Entrance Examination Board will convene on Wednesday, October 26, at the Hotel Biltmore in New York. A call to the meeting will be sent to all representatives about September 30.

The Fiftieth Anniversary Committee has decided to plan the Conference on Admission to American Colleges for the end rather than the beginning of the fiftieth year. The Conference will, therefore, be held in conjunction with the October 1950 rather than the October 1949 meeting.

Father Kenna Of Notre Dame Joins Executive Committee

Reverend Howard Kenna, C.S.C., Director of Studies at the University of Notre Dame, has been elected to the Board's Executive Committee. Father Kenna, who will serve until October 1950, will complete the unexpired term of President Katharine E. McBride of Bryn Mawr. Miss McBride, Vice-Chairman of the Board since the resignation last October of President Mildred McAfee Horton of Wellesley, has become an *ex officio* member of the Committee.

College Applications Down, Board Candidates Steady

Figures for the January and April examinations of the College Board indicate that the Board will examine nearly as many candidates this year as the record 78,158 in 1947–48. This is in spite of a reported 13 per cent decline in the number of applications received by member colleges to March 31, 1949, as compared with last year.

Frank H. Bowles, Director of the Board, attributed the continued heavy registration for Board examinations to the large number of colleges now requiring the tests for the first time. The drop in freshman applications, heaviest in men's colleges, where it is 21 per cent (women's colleges 8 per cent, coed colleges 11 per cent), he ascribed to the reduced number of veteran applicants and the high cost of living.

OFFICERS AND COMMITTEES OF THE COLLEGE BOARD, 1948–49

OFFICERS

Elected Officers

Chairman: Professor Edward S. Noyes, Yale University

Vice-Chairman: President Katharine E. McBride, Bryn Mawr College

Chairman of the Executive Committee: Professor Emeritus George W. Mullins, Barnard College

Custodians:

Dr. Claude M. Fuess, North Andover, Mass., *Chief Custodian*

President James H. Case, Jr., Washington and Jefferson College

Vice-President Archibald MacIntosh, Haverford College

Appointed Officers

Director and Treasurer: Mr. Frank H. Bowles, New York, N. Y.

Secretary: Mr. William C. Fels, New York, N. Y.

COMMITTEES

Executive Committee

Professor Emeritus George W. Mullins, Barnard College, *Chairman* (ex officio)

Dean Samuel T. Arnold, Brown University

Mr. Frank D. Ashburn, Brooks School, North Andover, Mass.

President Everett N. Case, Colgate University

Dr. Richard M. Gummere, Harvard University

Dean Radcliffe Heermance, Princeton University

Dr. Lemuel R. Johnston, Clifford J. Scott High School, East Orange, N. J.

Mr. Elwood Kastner, New York University

Rev. Howard Kenna, University of Notre Dame

President Katharine E. McBride, Bryn Mawr College (ex officio)

Dean Karl G. Miller, University of Pennsylvania

Professor Edward S. Noyes, Yale University (ex officio)

Mrs. Harold S. Osborne, Spence School, New York, N. Y.

Vice-President E. Kenneth Smiley, Lehigh University

Professor John M. Stalnaker, Stanford University

Committee on Examinations

Mr. Frank D. Ashburn, Brooks School, North Andover, Mass., *Chairman*

Dean Wilbur J. Bender, Harvard University

Dr. William H. Cornog, Central High School, Philadelphia, Pa.

Miss Rosamond Cross, Baldwin School, Bryn Mawr, Pa.

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Dean Ernest C. Marriner, Colby College

Dean Millicent C. McIntosh, Barnard College

Committee on Research and Development

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Dean Henry S. Dyer, Harvard University

Dean Sherwood R. Mercer, Muhlenberg College

Mr. Lester W. Nelson, High School, Scarsdale, N. Y.

President Rosemary Park, Connecticut College

Mr. William G. Saltonstall, Phillips Exeter Academy, Exeter, N. H.

Professor John M. Stalnaker, Stanford University

Committee on Finance

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Mrs. Harold S. Osborne, Spence School, New York, N. Y.

Dean C. Scott Porter, Amherst College

Committee on Audit

Dean Everett L. Hunt, Swarthmore College, *Chairman*

Dean H. Sherman Oberly, University of Pennsylvania

Committee on Nominations

President Roswell G. Ham, Mount Holyoke College, *Chairman*

Professor John M. Daniels, Carnegie Institute of Technology

Vice-President Archibald MacIntosh, Haverford College

Dean William E. Scott, University of Chicago

Dr. Charles C. Tillinghast, Horace Mann School for Boys, New York, N. Y.